

STUDIES IN THE COMPOSITAE-EUPATORIEAE,
XV. JALISCOA, MACVAUGHIELLA, OAXACANIA,
AND PLANALTOA.

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Continuing studies of the genera of the Eupatorieae have shown the need for the following revisions and clarifications. In the case of *Oaxacania*, it seems fitting to make comparison with the closely related *Carterothamnus*. *Macvaughiella* and *Jaliscoa*, each with two described species, have proved to have too narrow a species concept. *Planaltoa* has shown a number of previously undescribed useful characteristics when observed microscopically.

Jaliscoa S. Watson Proc. Amer. Acad. Arts Sci. 25: 153.
1890. (Type species, *Jaliscoa pringlei* S. Wats.)

Suffrutescent woody shrubs to 3 meters tall, ternately branched above. Stems erect, appressed-puberulous, very faintly striate. Leaves opposite or ternate, thin, very obscurely puberulous; blades ovate to broadly ovate, the margins crenulate-serrulate to sharply serrate, up to 16 cm long and 11 cm wide. Inflorescence a cymose-panicle; heads discoid, campanulate, up to 5 mm broad and ca 9 mm high (including style branches), ca 15 flowered, receptacle paleaceous, slightly convex or flat, phyllaries ca 12, imbricated, lanceolate, ca 3.5-4.0 mm long, apex obtuse or acute; corollas white, campanulate, ca 5 mm long (including lobes), 5-lobed, glabrous; stamens 5; anthers appendaged, the latter ca 225 μ long; style branches 2, greatly exerted at maturity, papillose, style slightly glandular; pappus an obscure, entire, callus border or a lacerate-fimbriate crown; achenes ca 2.5 mm long, dark brown, 4 angled, sparsely setose, setae biseriate; base of achene forming a distinct carpopodium; pollen spherical, tricolpate, distinctly spinose, ca 20-23 μ in diameter, chromosome number not determined.

Jaliscoa pringlei S. Watson, Proc. Amer. Acad. 25: 153. 1890.

[MEXICO: JALISCO: talus of cool ledges, bluffs of the Rio Grande de Santiago, Oct. 12, 1889, C. G. Pringle 2491. (Holotype GH!, Isotypes G!; MEXU!; MO!; NY!; PH!; UC!; US!)]

Jaliscoa pappifera S. F. Blake, Contr. U.S. Nat. Herb. 22: 587. 1924.

[MEXICO: MORELOS: barranca near Cuernavaca, 4500 ft, C. G. Pringle 9931. (Holotype US!, Isotypes F!; GH!; MO!; NY!)]

Additional specimens examined:

MEXICO: JALISCO: Puente San Pedro, 5 mi. SW of Tecalitlán, 1200 m., *McVaugh & Koelz* 1299 (MICH); 11-12 mi. SW of Autlán, ca. 1000 m., *McVaugh & Koelz* 873 (MICH); 2.5-4.0 mi. above (north of) La Cuesta, road to Talpa de Allende, 800-1000 m., *McVaugh* 21201 (MICH); barranca of Guadalajara, 4500 ft., *Pringle* 11544 (F, MICH, MO, US). Michoacán: Púerto Cruces, Coalcoman, *Hinton* 12374 (MICH). Morelos: barranca near Cuernavaca, 5000 ft., *Pringle* 6158 (F, ENCB, MEXU, MO, NY, PH, UC, US). State either Guerrero or Michoacán, Sierra Madre, *Langlassé* 575 (G, MICH, US).

After investigating a number of specimens, we find that only one species can be recognized in this complex.

The stems of this species seem to be particularly susceptible to insect damage, and the resulting numerous perforations are almost a characteristic.

Macvaughiiella R. M. King and H. Robinson Sida 3 (4): 282. 1968.

Schaetzellia Sch.-Bip. Flora 33: 419. 1850. Not *Schaetzellia* Klotzsch, Allgemeine Gartenzeitung 1849: 82. 1849.

(Type species *Schaetzellia mexicana* Sch.-Bip.)

Perennial or suffrutescent herb to one meter tall, sparingly branched. Stems mostly single, erect, pubescent, striate. Leaves thin, pubescent, deltoid to rhomboid, the margins serrate to dentate; blades up to 3 cm broad, up to 3.8 cm long. Inflorescence corymbose; heads discoid, campanulate to turbinate, 2-4 mm broad, ca 7 mm tall (including style branches), 16-25 flowered, receptacle conical, naked, phyllaries ca 10, imbricated, ovate-lanceolate, ca 5 mm long, ca 1.25 mm wide, apex acuminate; corollas white, funnelform, ca 3 mm long (including lobes), 5 lobed (lobes slightly longer than wide) outer surface of lobes bearing both glands and nonglandular uniseriate hairs; stamens 5; anthers appendaged, the latter ca 100 μ long and ca 150 μ wide around base; style branches 2, exerted at maturity, style bearing occasional glands ventrally; pappus consisting usually of 2 more rarely 1 or 3-4 setae, usually equaling the length of the corolla; achenes when dry very flat, dark brown, ca 2 mm long, base of achene forming a distinct carpopodium; pollen spherical, tricolpate, distinctly spinose, ca 18 μ in diameter; chromosome number not determined.

Key to varieties of *Macvaughiiella mexicana*.

Phyllaries essentially glabrous *M. mexicana* var. *mexicana*
Phyllaries pubescent *M. mexicana* var. *standleyi*

Macvaughiiella mexicana (Sch.-Bip.) R. M. King and H. Robinson
var. *mexicana*

Schaetzellia mexicana Sch.Bip., *Flora* 33: 419. 1850.

[MEXICO: VERACRUZ: Bord de la rivière à Acasonica, 1200 ft, Jan 1839, *J. Linden* 1168. (Holotype B, destroyed, Isotype P! Photo US!)]

Macvaughiiella mexicana (Sch.-Bip.) R. M. King and H. Robinson, *Sida* 3(4): 282. 1968.

Additional specimens examined:

MEXICO: VERACRUZ: Mirador, *Liebman* 63 (C); Puente Nacional, *Purpus* 14284 (A, UC); Zacuapan, Fortin, *Purpus* 2855 (US); near Rancho Viejo, *Purpus* 16220 (A); Barranca de Tenampa, *Purpus* 2189 (F, GH, MO, P, UC, US); without precise locality, *Galeotti* 2302 (P, W).

Macvaughiiella mexicana (Sch.-Bip.) R. M. King and H. Robinson var. *standleyi* (Steyermark) R. M. King & H. Robinson *stat. nov.*

Schaetzellia standleyi Steyermark, *Publ. Field Mus. Nat. Hist., Bot.* 23: 107. 1944.

[GUATEMALA: CHIQUMULA: Montaña Castilla, vicinity of Montaña Cebollas, along Río Lucía Saso, 3 mi SE of Quezaltepeque, alt. 1200-1500 m, Nov 6, 1939, *J. A. Steyermark* 31344 (Holotype F! Photo US!)]

Macvaughiiella standleyi (Steyermark) R. M. King and H. Robinson, *Sida* 3(4): 282. 1968.

Additional specimens examined:

MEXICO: VERACRUZ: Zacuapan, Sulphur Spring, *Purpus* 2189a (F, NY).

GUATEMALA: JALAPA: vicinity of Jalapa, *Standley* 76699 (F, US), 77406 (F); Jutiapa: quebrada above Ovejero, on road between Monjas (Dept. Jalapa) and El Progreso, alt. ca 1400 m, *Standley* 77645 (F); Lago Retana, between Ovejero and Progreso, *Steyermark* 32041 (F).

EL SALVADOR: LA LIBERTAD: road to La Libertad, *Molina, Burger & Wallenla* 16687 (F); between Guayabal and Río Guaza, *Calerón* 1936 (US); SAN VICENTE: vicinity of San Vicente, *Standley & Padilla* 3639 (F, GH).

HONDURAS: CHOLUTECA: vicinity of San Marcos de Colón, *Standley* 15903 (F, GH, US). EL PARÁISO: along or near Río California, between Río Choluteca and Jacaleapa, *Standley* 17176 (F); Río Choluteca at Ojo de Agua, *L. O. Williams* 17310 (F, GH, US), *Standley* 4683 (F, GH). MORAZÁN: El Quebracho, above El Zamorano, *Standley* 357 (F); quebrada El Horno, entre El Frijolar y Tabla Grande, *Molina* 833 (F); Matorrales secos de Puente Colorado, al norte de Tegucigalpa, *Molina* 3885 (F); near Río El Quebracho above El Jicarito, *Standley* 27753 (F, GH, MO, US); drainage of the Río Yeguaré about Longitude 87° W. and Latitude 14° N., *L. O. Williams* 17039 (F, GH,

MO, US), *Molina* 1758 (F, GH, MO, US), *L. O. Williams & Molina s.n.* (F, US); slopes of Cerro de Uyuca, along trail between Hoya Grande and Valle Encantado, *Standley* 15246 (F, GH, NY, US); region of El Jicarito, above El Zamorano, *Standley* 25134 (GH).

It should be noted that the ranges of the two varieties do overlap in Veracruz as indicated by collections cited as *Purpus* 2189.

Oaxacania B. L. Robinson & J. Greenm. Amer. Journ. Sci. III. 50: 151, 152. 1895. (Type species, *Oaxacania malvaefolia* B. L. Robinson & J. Greenm.)

Sprawling herbs or sub-shrubs up to one meter long, somewhat woody at base, many branched. Stems striate, covered with glandular hairs. Leaves alternate, blades thin, orbicular or reniform, 3-7 cleft two thirds or more toward base, lobes oblong, glandular pubescent on both surfaces, up to 3.5 cm wide and long, petioles 2-3 cm long. Inflorescences numerous, short peduncled, monocephalic; heads discoid, campanulate, 1-1.2 cm high (including style branches), ca 100 flowered, receptacle paleaceous, convex, phyllaries ca 30-40, in 5 series, lanceolate, 3 nerved, corollas white, campanulate, ca 6.5 mm long (including lobes), 5 lobed, outer surface covered with numerous long stalked glands; stamens 5, anthers appendaged, the latter ca 60 μ long, filaments with distinct collars developed just below the anther; style branches 2, greatly exserted at maturity, papillose, style glabrous; pappus obsolete or a short lacerate crown; achenes linear-oblong, strongly compressed, 4 angled, setose, setae biseriate; base of achene forming a distinct carpopodium; pollen spherical, tricolpate, very distinctly spinose, ca 25 μ in diameter, spines up to 2 μ long, chromosome number not determined.

Oaxacania malvaefolia B. L. Robinson & J. Greenm. Amer. Journ. Sci. III. 50: 151. 1895.

[MEXICO: OAXACA: dry cliffs, Tomellin Canyon, 3,000 ft Dec. 22, 1894, *C. G. Pringle* 6117 (Holotype GH!, Isotypes G!; ENCB!; MEXU!; MICH!; MO!; NY!; UC!; US!)]

Additional specimens examined:

MEXICO: OAXACA: Chiltapin; Oaxaca side of Río Santa Lucia, *Purpus* 3084 (F, MO, NY, UC, US); De Almoloyas a Santa Catarena, *Conzatti* 1654 (F, MEXU, US).

Oaxacania bears considerable resemblance to *Carterothamnus* R. M. King, but is clearly distinguished by characters indicated in the following table:

<i>Oaxacania</i>	<i>Carterothamnus</i>
achenes flattened	symmetrical achenes
long stalked glands on corolla	corolla glabrous
obsolete pappus	pappus of numerous scales and one long seta
thin hardly expanded tips of the style	thick knoblike tips of the style
small firm cells forming collar at the base of anther	very lax cells forming collar at base of anther

Planaltoa P. Taubert Engl. Bot. Jahrb. **20**: 454. 1896.

(Type species, *Planaltoa salviifolia* Taubert)

Woody shrubs or sub-shrubs. Leaves simple, alternate, sessile. Peduncles not strongly differentiated. Inflorescence polycephalic. Heads turbinate or cylindrical, 4-5 flowered. Phyllaries subequal, in 2-3 series, lanceolate. Corollas slender, tubular, regular, 5 lobed, outer surface with both glands and hairs. Hairs and stalks of glands on corolla often biseriate. Receptacle flat, naked. Anther appendages rather large with slightly reflexed margins. Pollen spherical, tricolpate, distinctly spinose. Style branches elongate, exerted at maturity, narrowly obtuse; basal node of style covered with nonglandular hairs. Pappus lacking. Achenes 5-6 angled, glabrous.

The species of *Planaltoa* may be distinguished by the following key:

1. Leaf blades oblong-elliptical, most hairs of plant with glandular tips, inner surface of corolla glabrous. *P. salviifolia*
1. Leaf blades lanceolate, slightly auriculate, hairs of plant without glandular tips, lobes with shorter uniseriate hairs both on the inner and outer surfaces. *P. lychnophoroides*

Planaltoa salviifolia Taubert, Engl. Bot. Jahrb. **21**: 454. 1896.

[BRAZIL: GOIÁS: Serra dos Pyrenos, 1892-1893, *Ule* 2971 (B, destroyed)]

Plants ca. one meter tall? Stems few-branched, terete. Stems, leaves, phyllaries, and outer surface of corolla covered with dense long pubescence, hairs bearing minute secretory cells apically. Leaves rigid, sessile. Blades oblong-elliptical, 6-10 mm wide, apex obtusely pointed; margins with minute recurved teeth in the upper half. Heads ca 15 mm high (including style branches), ca 4-5 flowered. Phyllaries 5-7, imbricated, in 2-3 series, ca 12 mm long. Florets ca 8 mm long. Lower outer surface of corolla with a few blunt, uniseriate, pitted, nonglandular projections; outer surface with long biseriate hairs bearing minute secretory cells apically, upper $\frac{3}{4}$ of outer surface with scattered subsessile glands, inner surface of corolla

glabrous. Stamens 5. Anthers (including appendages) ca 3 mm long and 250 μ wide; appendages 250 μ wide and 200 μ long. Style branches papillose, slightly broader apically, exerted at maturity. Achenes prismatic, dark brown at maturity, ca 3 mm long, ca .75 mm wide. Pollen 25 μ in diameter. Chromosome number not determined.

Additional specimens examined:

BRAZIL: GOIÁS: Pirineus, Corumba, *Macedo* 3715 (MO, NY, US); without precise locality, *Glaziou* 21618 (G, GH, US). Without precise locality, *Voyage d' Auguste de Saint-Hilaire de 1816 à 1821* (F).

Planaltoa lychnophoroides G. M. Barroso, *Sellowia* 17: 79. 1965.

[BRAZIL: GOIÁS: Cachoeira de Vargem Grande, 1894-95, *Glaziou* 21594. (Holotype G!; Isotype F!)]

Plants ca. one meter tall. Stems branched, terete. Stems, leaves, phyllaries, and outer surface of corolla with dense long nonglandular pubescence. Leaves rigid, sessile, lanceolate, slightly auriculate, 2.5-3.0 cm long, 3.0-5.0 mm wide; lower surface with occasional subsessile glands; margins reflexed, serrate. Heads ca 10 mm high (including style branches), 4-5 flowered. Phyllaries 5-7, imbricated, in two series, ca 10 mm long; outer surface with glands. Florets ca 7-8 mm long. Outer surface of corolla with long uniseriate, non-glandular hairs; lower outer surface of corolla with many biseriate non-glandular setae intermixed with hairs; lobes with shorter uniseriate hairs both on the inner and outer surfaces; subsessile glands sparse on the upper outer surface of corolla. Stamens 5. Anthers (including appendages) ca 2.5 mm long and 450 μ wide; appendages 250 μ wide and 300 μ long. Style branches long-papillose, exerted at maturity. Achenes prismatic, dark brown at maturity, ca 3 mm long, ca .75 mm wide. Pollen 25 μ in diameter. Chromosome number not determined.

Additional specimens examined:

BRAZIL: GOIÁS: 7 km W of Veadeiros, *Irwin, Greer, Souza, Santos* 12909 (MO, TEX, US).

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